Nutrition News

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DIET AND PERIODONTAL DISEASE

By W. J. LINGHORNE, D.D.S., F.I.C.D.
Banting and Best Department of Medical Research
University of Toronto, Canada

During mastication considerable force is applied to the teeth. The supporting structures of the teeth are ingeniously designed to cushion and sustain this stress.

The teeth are slung in sockets in the jawbones by connective tissue fibers buried at one end in the socket bone and at the other end in a bone-like material called cementum, deposited on the roots of the teeth. The projection of the jaw bone that surrounds and forms the sockets in which the roots of the teeth are held is called the alveolar process.

The alveolar process is covered by a thin layer of dense connective tissue called the gingiva or gum. This collar of connective tissue also is attached to the roots of the teeth by means of connective tissue fibers fixed in cementum. The gingiva is covered by the mucous membrane of the oral cavity, which forms in a band around the roots of the teeth.

To prevent contamination by leakage into the tissues around the teeth, the mucous membrane lining the mouth is continued around the teeth in the form of a band of epithelium. This band in contact with the teeth is called the epithelial attachment.

The several types of tissue, bone, connective tissue and epithelium that hold the teeth in the jaws are known as the periodontium or periodontal tissues.

Periodontal Disease

Disease affecting the periodontal tissue is called periodontal disease. It is often manifested by redness, puffiness or bleeding of the gums on brushing. Pain is seldom a symptom until the later stages. Disease confined to the gums (gingiva) is called gingival disease. The most common type of periodontal disease is often referred to by the laity as pyorrhea.

At a conference on periodontal disease conducted by the University of Michigan School of Public Health and School of Dentistry, September 1951, the evaluating committee reported on the prevalence of periodontal disease. They stated that "gingival disease is prevalent among children and almost universal in adults. More advanced periodontal disease is common in the adult population and the prevalence increases with age."

Once fully formed, our teeth are supposed to last a life time. Their metabolism is low. In contrast, tissues of the periodontium, like many other tissues of the body, are continually being replaced. Thus the periodontium is affected by general metabolic disturbances much more than is the tooth.

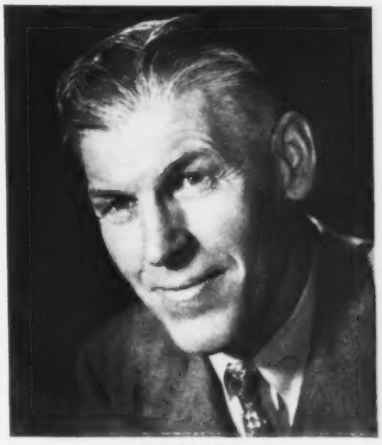
During the course of periodontal disease the tissue is gradually detached from the teeth and the bony sockets disappear. With the loss of support the teeth become loose and tender, and often have to be extracted.

Influence of Diet

Inadequate nutrition has long been considered a contributary cause in periodontal disease. The periodontal tissues are peculiarly susceptible to improper diet.

Firstly, the materials for continuous replacement of periodontal tissues must come from the diet. Deficiency of certain essential nutrients results in inadequate replacement, thus affecting the integrity of the periodontium.

Secondly, function is an important stimulus to replacement. The functional exercise of the periodontium is the chewing of food. Therefore, the physical character of the diet also has a bearing on the health of the periodontium. Soft foods, requiring little chewing, provide little functional stimulation to the supporting structures. Again, soft sticky foods tend to cling to the teeth, especially at the gum line, causing gingival disease. Coarse fibrous foods require vigorous chewing and clean teeth more thoroughly. A diet



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should contain food of this physical character as well as required nutrients.

For the replacement of the bone, connective tissue, and epithelium that constitute the periodontium, the following dietary essentials are particularly needed: vitamins A, B-complex, C and D, calcium, phosphorus, and protein.

These foods should be used every day by adults, for periodontal health:

At least one pint of milk or its equivalent in other dairy foods and at least one serving of meat, fish, or fowl . . . to obtain protein, calcium, phosphorus, and B-complex vitamins. (Whole-grain or enriched cereals and bread also contribute some of all these nutrients.)

One orange, one-half grapefruit, 4 ounces citrus juice, or 8 ounces tomato juice, with other fruits and vegetables . . . to obtain vitamin C.

At least one serving of green or yellow vegetables (some raw) . . . to obtain vitamin A, in addition to that provided by dairy foods and fruits.

Vitamin D milk, or a vitamin D preparation if advised, especially needed in the winter . . . to obtain vitamin D.

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Glances AT NUTRITION RESEARCH

An open mind and conservative interpretations will profit dietitian, physician, teacher, and others who make practical application of nutrition research findings. New facts from the laboratory may either verify or disprove tentative or long established concepts in nutrition.

Fat Is A Dietary Essential—Fat is as essential in the diet as protein, carbohydrate, minerals, or vitamins. This conclusion was drawn by investigators upon observing: 1) weight gain, health, and lively spirits in a dog which received for four weeks by vein a ration containing 34% fat, 16% protein, and 50% carbohydrate; while 2) dogs receiving an equal number of calories for four weeks by vein from a ration containing 16% protein and 84% carbohydrate, with and without essential fatty acids, lost weight and were apathetic and emaciated in appearance.

—J. Clin. Nutrition 1 :372 (July-Aug.) 1953.

Heat Processing and Milk Proteins—Commercial heat processing of fluid milk may actually increase the nutritive value of milk proteins. This is indicated by the results of recent tests in which milk solids were heated in the presence of varying levels of water at 15 pounds pressure for 30 minutes. Crystalline digestive enzymes were able to release more amino acid nitrogen at a more rapid rate after milk solids were heated in the presence of even minimal amounts of water than when unheated or when heated dry. Nitrogen balance tests with intact animals showed no decrease in nutritive value of milk proteins as the result of such heat treatment in the presence of water.

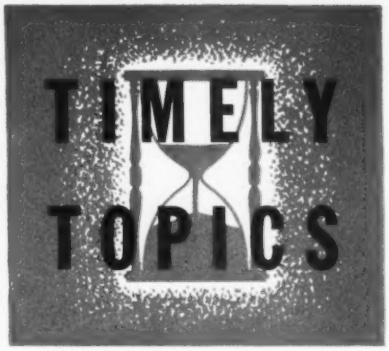
—J. Nutrition 50 :351 (July) 1953.

Ca:P Ratios and Mineral Retention—Retention of calcium and/or phosphorus are little affected by the ratio of these minerals in the diet. Increasing the intake of calcium results in increased calcium retention. Increasing the intake of phosphorus does not consistently increase phosphorus retention. These facts were demonstrated by balance studies in which widely varying levels and ratios of calcium and phosphorus were fed to 18 young adult women on a controlled diet.

—J. Nutrition 50 :373 (July) 1953.

Trace Minerals versus Brucellosis—The alleged protective or curative effect of trace minerals against either bovine or human brucellosis is not supported by a recently reported study. Supplementing the diet of unvaccinated cows with Mn, Cu, Co, Zn, and Mg for four and one-half months prior to exposure did not affect the resistance of cows to induced infection with a virulent strain of Br. abortus. No difference was observed between two unvaccinated groups of supplemented and non-supplemented cows in: 1) incidence of abortion in pregnant cows: 2) presence of organism in blood and/or milk; or 3) rate of spontaneous recovery from infection. Vaccinated cows receiving no trace mineral supplement showed a much greater resistance to infection than either of the unvaccinated groups.

—J. Am. Med. Assn. 153 :643 (Oct.) 1953.



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Dr. Linghorne is research associate in the Banting and Best Department of Medical Research and special lecturer in dentistry, University of Toronto. He has been on the university faculty since World War II. During the war, he was in charge of research for the Canadian Army Dental Corps in treatment and control of Vincent's Infection and other periodontal diseases and worked with the R.C.A.F. Nutritional Group, particularly in research on vitamin C. He is a specialist in periodontia, Royal College of Dental Surgeons, and confines a part time private practice to periodontia.

Health in Colleges

Ways for protecting and improving the health of college students and of relating health programs to all other college functions will be considered at the Fourth National Conference on Health in Colleges, May 5-8, Hotel Statler, New York City. Dr. J. L. Morrill, president of the University of Minnesota, is president of the conference. Seminars will be conducted. Previous conferences were in 1931, 1936, and 1947.

A World Congress

Thirty-two nations were represented at the first World Congress for Milk Utilization, Washington, D.C., November 1953. Discussion centered around consideration of objectives, such as the enormous program of teaching people in "milk-shortage" areas of the world to produce and process their own milk and safe milk, and methods of stimulating movement of milk from world surplus to world deficit areas.

THE IMPORTANCE OF HOME CARE OF MILK

By S. J. Weese, M.A., Associate Professor Dairy Husbandry
*West Virginia Agricultural Experiment Station**

Delivery every other day or three times a week is sufficient for pasteurized or pasteurized-homogenized milk of good quality, provided the processor and consumer use reasonable care in handling the milk. Confirmation of this and evidence of the significant influence of the kind of home care given milk appears in a recent report based on a three-month study with eighteen housewives who received milk every other day.

That milk under such delivery can be kept satisfactorily in home refrigerators is important to the consumers and to the dairy industry. Several investigators had previously found that the keeping quality of pasteurized milk permits every-other-day delivery at all seasons. However, some studies had not duplicated usual home conditions. Others found considerable variation due to storage temperatures — successful storage of milk kept near 40°F. and poor keeping quality of milk in summer when stored above 50°F.

This study was made to determine how long both pasteurized and pasteurized-homogenized milk maintains satisfactory quality in mechanical home refrigerators under ordinary conditions.

All the milk used in this study was produced and processed under standard conditions at the University Experiment Station and stored at 40°F. until delivery the following morning. The milk was not refrigerated in delivery; nor were the samples of home-stored milk refrigerated in transit back to the laboratory for checking. Some deliveries were twenty miles distant. The study was conducted during the summer. The milk was left in the home for three to six days, with tests made on each of these days. Each family was asked to treat this milk in the same way as their regularly delivered milk. No special instructions were given for its care.

As might be expected there was wide variation in the way milk was handled by the different families. The experimental findings clearly demonstrated the influence of home care on the flavor and keeping quality of milk. It was a striking fact that returned milk from some families scored consistently higher in flavor and lower in bacteria count and acidity than the average.

Some families were careless about promptly refrigerating the milk and in replacing the cap after part of the milk was used. Uncapped milk and improper replacement of caps was responsible for most of the absorbed flavors of the returned samples. In some cases the tasting panel could tell what had been stored in the refrigerator by the absorbed odor and flavor in the returned milk sample.

The keeping quality of the milk delivered twenty miles away compared well with that of milk delivered only a few blocks.

While the returned milk samples from the different homes showed variation in flavor and keeping quality, a high percent showed no significant uniform drop in quality until the fifth day of storage. The pasteurized-homogenized milk retained a slightly higher flavor score than the regular pasteurized milk. The difference was greatest on the fifth day; least on the sixth day.

This controlled study with housewives clearly points up the importance of proper home care if milk's original good flavor and high quality are to be retained. (1) Prompt refrigeration on delivery makes a significant difference in the flavor and keeping quality, as well as vitamin values. (2) Prompt return to the refrigerator and tight capping or closing after part of the milk in a container has been used protects the fresh flavor of the milk. Milk which stands unrefrigerated and uncovered for only half an hour loses some quality and freshness. Milk which is **kept** cold is the best milk! (3) Good housekeeping in the refrigerator pays off. A clean refrigerator in which all foods are stored in covered containers, not only protects the flavor of milk, but also helps preserve the freshness of other foods.

The care given milk in the home makes a significant difference in its taste and appeal. With reasonable care there should be no problem in keeping the appealing freshness of good milk from delivery to delivery whether made every other day or three times a week.

*A study conducted jointly with J. E. Fike, M.S., Instructor in Dairy Husbandry, West Virginia Experiment Station.

THE IOWA PROGRAM IN DENTAL HEALTH

By Elvira L. Grabow, B.S., R.N., Nurse-Consultant in Dental Health
Iowa State Department of Health

Last year was the Silver Anniversary of the Bureau of Dental Hygiene which has promoted the dental health program for children of Iowa. Our state is one of the few which have stressed dental care for children over a long period of years. The Bureau of Dental Hygiene is sponsored jointly by Iowa State Department of Health and State University of Iowa. It came into being to carry on the work which the Shepard-Towner Act had made possible and for which funds expired in 1926. At present, Children's Bureau funds administered through the Maternal and Child Health Division of Iowa State Department of Health are used in part, in support of the Bureau.

Iowa had early leaders in the dental and educational field who saw the value of the program and had the vision to carry on. While the emphasis in the earlier program had been on the preschool child, it was agreed that the new program was to include school children in public and parochial schools. The primary purpose was to initiate a statewide program of education.

After much counsel, the Iowa Plan for Dental Health Education was evolved. As an organized plan, it embodied three objectives: education, prevention, and correction.

Educationally, the objective was to develop and provide sound educational material to the classroom teacher. The preventive point of view was emphasized through home participation in a routine program of dental hygiene and dietary habits. The corrective phase was stressed by use of the dental referral card. This brought systematic and regular examinations in the dental office where completion of the necessary work was recommended. As an incentive, the dentists agreed to examine the teeth free of charge if the pupil came to him with the dental card.

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—that in the United States, consumption of milk and its equivalent in other dairy foods except butter now averages about 2.7 cups a day per person, considerably higher than in prewar years?

—that nearly 1/3rd of our school children are participating in the school lunch program and during one school year, 1952, drank 359 million quarts of milk, ate 248 million pounds of other dairy foods, 25 million dozen eggs, as well as other foods?

—that as made today, ice cream is largely milk products and is moderate in sweetening . . . 1/3rd pint or 2/3rds of a cup of vanilla ice cream containing a little over one tablespoon of added sugars . . . 1/4th pint or 1/2 of a cup, slightly less than one tablespoon of added sugars?

—that lactose, the sugar of milk, is better utilized when butterfat is present in the diet and lactose has a favorable effect on the microflora of the intestinal tract?

—that tooth loss after age 35 is caused to a large degree by diseases of the gums and bone structure surrounding the teeth according to a recent study by three University of Illinois dental scientists?

—that in making American cheese, about 4/5ths of the calcium and protein, 2/3rds of the phosphorus, and most of the milk fat and vitamin A of the original milk remain in the finished cheese?

THINGS YOU'LL LIKE TO READ

A Survey of the Literature of Dental Caries—Prepared for the Food and Nutrition Board under supervision of the Committee on Dental Health. Publication 225, National Academy of Sciences—National Research Council, Washington, D.C. 1952. $6.00.

This critical review by specialists in dental research and dental health provides, in tangible form, the sources and nature of investigations upon which present knowledge of dental caries rests. The summaries of each section are significant. The review is a distinct contribution to dentistry and health education.

Some Aspects of Every-Other-Day Milk Delivery—S. J. Weese and J. E. Pike. Current Report 5, West Virginia University Agricultural Experiment Station, Morgantown, West Virginia. August 1953. Single copy available on request.

This bulletin reports in detail the study of which S. J. Weese writes in this issue of NUTRITION NEWS.

The Composition of Milks—Publication 254, National Academy of Sciences—National Research Council, Washington, D.C. Revised 1953. $2.00.

This revision supersedes the original bulletin of 1950. Certain corrections have been made and new data incorporated. The detailed compilation of comparative composition and properties of human, cow, and goat milk is especially useful to research workers and to those concerned with infant feeding.

Recipes for Quantity Service—PA 226. Bureau of Human Nutrition and Home Economics, Agricultural Research Administration, U.S. Department of Agriculture, Washington, D.C. July 1953. (Food Service VIII.)

This is the eighth in a series of leaflets of quantity recipes featuring widely available foods. Fifteen tested recipes for soup, main dishes, vegetables, salads, breads, and desserts are included.

THE IOWA PROGRAM IN DENTAL HEALTH

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The phases of the program stressed were: nutrition, oral hygiene and regular, periodic visits to dentist. These foods were recommended daily for the average child 3 to 16 years of age: one quart of milk, one or two eggs, one serving meat, liver, fish, or chicken, two vegetables, one orange or tomato, one additional fruit, one teaspoon of cod-liver oil, and six teaspoons of butter; bread, cereal, and potatoes added to satisfy the appetite.

Formerly, brushing the teeth upon arising and before going to bed was the accepted practice; today, emphasis is on brushing immediately after each meal and rinsing the mouth with water after ingestion of sweets and starchy foods. Yearly visits to the dentist or as often as he advises, are encouraged.

We depend upon the classroom teacher for the teaching of dental health. She has the skill to do this. But we recognize that it is the dental profession's responsibility to provide the teacher with sound information. A handbook for her and a manual on dental health education for the nurses have been prepared.

The above is essentially the program today. Added are the new weapons to help control tooth decay: topical application of sodium fluoride and fluoridation of public water supplies.

The past year, 91 percent of our rural schools, 59 percent of our town, and 49 percent of our parochial schools were active in the dental health program. More than half of the dental cards were returned.

The Iowa program has been functioning well because of the cooperation of many people: the dentists, school administrators, teachers, nurses, lay public, and the children. Without the help of all these this fine example of a dental health program in action would not be possible.

In observance of National Children's Dental Health Day, we renew our pledge to the challenge: "Better Dental Health for Iowa Children."